

CIVIL AERONAUTICS JOURNAL



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CIVIL AERONAUTICS ADMINISTRATION

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NUMBER 1

1941 Best Year in History of U. S. Aviation—Hinckley

Planes and Pilots Gain; Airport Program Develops

"The year 1941 was the greatest in the history of American aviation," stated Robert H. Hinckley, Assistant Secretary of Commerce for Air, in releasing year-end summaries of 1941 achievements in the field of civil aviation.

Emphasizing that the achievements were largely brought about as part of the defense effort, Mr. Hinckley underlined the fact that they nevertheless made possible giant strides forward in civil aviation in the U. S., which will undoubtedly contribute to fulfillment of the new tasks imposed by the war.

The year-end found the country with far greater numbers of planes and pilots, a vastly improved system of airports and airways, and highly intensified use of all facilities for transport of passengers, express, and mail, according to statistics furnished Mr. Hinckley by Donald H. Connolly, Administrator of Civil Aeronautics.

Civilian Pilot Training Program

"The nation's civilian pilot roster passed the 100,000 mark during the year," General Connolly reported. "The increase of more than 60 percent over the 1940 total of 63,113 is accounted for almost entirely by the training program of the Civil Aeronautics Administration, which grew in importance as a feeder of pilots and instructors to the military forces. By the close of the year, the Army and Navy were getting one-

third of their flying cadets from the ranks of C. A. A.-trainees, some 14,000 of whom were estimated to have entered the air services. In addition, about 2,800 C. A. A. instructors have gone to defense units here or in Canada, and we now have underway a program for training 3,200 new instructors, to assure the continued mass production of pilots."

During the year, 30,000 young men completed elementary courses, with 9,800 still in training. Graduates of secondary courses in 1941 numbered 6,000, with 3,000 in training at the year's close. Instructor and refresher courses were completed by 6,000 during 1941. There were approximately 550 ground schools and 600 flight centers participating in the program when the year ended.

The number of certificated civil aircraft increased from 17,500 to approximately 27,500¹ during the year. A substantial part of this gain is accounted for by trainer planes used in the C. A. A. program.

Latin American Cooperation

Late in the year the C. A. A. announced details of plans for the training of Latin American youths in the United States as pilots and aviation technicians.

Sponsored by the Interdepartmental Committee on Technical Aviation Training for Citizens of the Latin American Republics, the program called for training courses varying in length from six

(See YEAR END, page 4)

¹ 1941 totals are based on actual reports through November, and estimates for the final month of the year.

Army Gives Rules For Plane Flights

The Army Air Corps has announced the following regulations governing aircraft operations, effective December 15, 1941:

1. Active Air Defense Zones have been established along the coastal frontiers of the United States.

2. The following procedure will be instituted immediately to enable the identification of friendly aircraft flying in any portion of the zones whose limits are as follows:

(a) *East coast.*—A zone extending from the Canada-U. S. border to Savannah, Ga., and from the shore line extending 150 miles inland and 200 miles seaward. Extension southward to Key West, Fla., is anticipated in the near future.

(b) *West coast.*—A zone extending from the Canada-U. S. border to the Mexico-U. S. border, and extending from the shore line 150 miles inland and 200 miles seaward.

(c) Local extension of the reporting procedure or of zone boundaries pertaining to the active Air Defense Zone within each Air Force area may be prescribed by the Interceptor Commander of that Air Force when the situation requires such action. He will advise all concerned of any such extension.

3. It is essential that in the prescribed zones complete and timely information be available to Air Corps Information Centers concerning all friendly military, naval, and civil aircraft in flight, other than local flights confined to a 10-mile radius of the departure airport.

4. No flight by aircraft of any description will be made within the pre-

(See FLIGHT RULES, page 10)

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Glider Training for Officers

The War Department has announced opening of a new glider training school for Air Corps officers at 29-Palms, Calif., which ultimately will train 24 pilots every 4 weeks.

Service and Information

Merchants and manufacturers seeking Government contracts are invited to apply to the Service and Information Office, Room 1060, Department of Commerce, Washington, D. C., for aid in making contact with the proper Government officials. This office cannot promise that it will secure Government contracts for anybody, but it will make sure that business men will be put in touch promptly with the Government agencies that are buying the things they have to sell. This service is free, and is available to all business men, whether or not they come to Washington.

—Keep 'Em Flying—

New Aeronautical Publications

Among recent government publications dealing with the subject of aeronautics are the following:

ARMY TECHNICAL MANUAL 1-705; physiological aspects of flying and maintenance of physical fitness; 127 pages illustrated. Price 25 cents. Classification number W 1.35: 1-705.
NATIONAL BUREAU OF STANDARDS, RESEARCH PAPER 1428; locating the principal point of precision airplane mapping cameras; p. 405-412, illustrated; price 10 cents. Classification number C 13.22/a: 1428.

When ordering these publications, send remittance by postal money order, express order, coupons, or check to the Superintendent of Documents, Government Printing Office, Washington, D. C. Always give title, issuing office, or classification number when listed.

Legislative Action

Listed below are recent measures concerning aeronautics acted upon by Congress. A complete list of all proposed legislation appeared in CIVIL AERONAUTICS JOURNAL, Volume 2, No. 11, dated June 1, 1941, and subsequent issues.

H. R. 6159—THIRD SUPPLEMENTAL NATIONAL DEFENSE APPROPRIATIONS; passed by the Senate December 12, 1941; includes appropriations for additional C. A. A. airport projects, technical development and establishment of air navigation facilities; purchase by Navy and improvement of Floyd Bennett Field, construction of airplane engine research laboratory for N. A. C. A., and under "Bureau of Aeronautics" additional plant facilities in public and private plants.

—Keep 'Em Flying—

3,000,000 Delivery Miles

The Army Air Corps Ferrying Command has reported more than 3,000,000 miles of safe delivery flights have been accomplished by the service which flies newly manufactured planes from the factories to delivery points on this side of the ocean.



The hazards of landing and taking-off at night have been greatly reduced through the development of effective airport lighting. The Technical Development Division of the Civil Aeronautics Administration has contributed to this phase of air safety through study of the problems involved, experimentation, and consultation with flying personnel and lighting equipment manufacturers.

Perhaps the best example of this service is the new Washington National Airport, which recently was termed "the best lighted airport in the world" by members of the Illuminating Engineering Society. The airport's lighting system was worked out by the Technical Development Division in cooperation with manufacturers of airport lighting equipment. It includes all the normal airport lights, such as boundary, range, obstruction, floodlighting, and contact lighting, and has, in addition, a complete installation of traffic-control lighting and taxi-guidance lighting.

So complete is the equipment and planning of the airport's lighting that even if all radio communication between plane and ground should be halted, operations of aircraft landing, taxiing, and taking-off could be controlled from the airport tower by a system of lights with a maximum of safety.

The lighting at the Washington airport is designed for the needs of the largest and most heavily used commercial airports. This complete system may not be needed on smaller airports. But it is important that all lighting used on any airport conform to standard patterns, and use equipment which gives uniform results.

Here again the Technical Development Division renders a valuable service by helping to determine the highest standards and specifications for equipment and operation practices. These standards are imposed as mandatory regulations by the C. A. A. wherever Federal funds are used for installation or improvement, and are recommended for all airports. They provide for equipment built to definite performance standards, and also for the arrangement and methods of installation. In some cases, such as the lighting and marking of obstructions and the lighting of air markers, methods may have to vary to meet varying conditions. In such instances, possible procedures are explained and recommendations made.

Meeting Problems of Cold Weather Operation

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Flying Need Not Be Curtailed During Winter Months if Proper Precautions Are Taken

Following are excerpts from a *Safety Bulletin, Cold Weather Operation*, written by Alexander N. Troshkin, *Powerplant Specialist*, and issued by the Civil Aeronautics Board. Problems of aircraft and engine icing have been covered in other *Safety Bulletins*. (See p. 6 of this issue.) This bulletin discusses treatment and preparations necessary before starting winter operations, and offers suggestions for promoting safety in operation. Copies of the complete bulletin may be obtained from the Publications and Statistics Division, Civil Aeronautics Administration, Washington, D. C.

Flying operation during the winter months need not be curtailed provided the proper attention is given to the equipment, personnel, and weather. The aircraft structure and power plant require additional attention to meet the more rigorous conditions of cold weather operation. There should be some provision made for properly heating the cabin or the personnel should be provided with suitable, warm clothing. The aircraft should be protected during storage from deterioration and possible damage due to snow, ice, etc. The personnel should be familiar with various weather conditions and their possible effects on operations.

Engine Wear

Engine operation during cold weather is far more severe on all parts of the power plant than during summer weather. The increase in wear and stress is more pronounced during the starting and warming-up period. At low temperatures the oil does not flow as readily to the engine parts requiring lubrication. Thus, during the starting period, there is the increased wear on the various bearing surfaces which may fail to get any, or the proper amount of lubrication.

Furthermore, at low temperatures it is difficult to start an engine sometimes because the fuel charge in the combustion chamber does not completely vaporize to form the vapor air-fuel ratio necessary for combustion. In order to obtain the required vapor concentration, the pilot will generally increase the priming. In doing so, he also increases the amount of wet or liquid fuel in the cylinder. The liquid fuel will wash the lubricant away from the cylinder walls and also pass down into the sump or crankcase, resulting in excessive oil dilution. Excessive priming should be avoided.

It is advisable to change the oil oftener during winter operation because of the increased tendency toward dilution and sludging. It is good practice

at all times to drain the oil when the engine is hot in order to drain out as much of the old oil as possible. Many operators strain the old oil immediately after draining in order to check for metal flakes, chips, etc., which would be the warning of excessive wear and an impending power plant failure unless corrected.

Oil Preheating

Wherever possible, an effort should be made to store the aircraft in a heated hangar during cold weather. If this is not feasible, it is advisable to heat the oil thoroughly before starting the engine. When the oil supply is carried in the crankcase or sump, it is good practice to drain the oil at the end of the day's operations and to heat it before resuming the following day's operations. This will increase the efficiency of lubrication at starting and will also aid in rapidly bringing the engine up to operating temperature and assist in the proper vaporization and combustion of the fuel.

Do not forget to tighten and safety the sump plug after draining the engine in preparation for oil preheating. In the case of dry-sump engines, where the oil is carried in a separate oil tank, an immersion-type electric heater can be used to warm up the oil. A blowtorch should never be used to heat the oil tank or engine crankcase. Several fires have been started by this practice. It is preferable to preheat the oil in a double boiler rather than place the container in direct contact with a hot plate or open flame burner.

Oil Temperature

During cold weather operations, it is necessary to close the front opening in the engine cowl in order to maintain suitable oil temperature conditions. Most manufacturers supply standard plates for this purpose. If it is noted that during extremely cold weather it is not possible to maintain temperatures within the range specified by the engine manufacturer, even with the cowl closed, it may be necessary to lag the oil lines and tank in case of dry-sump engines and to lag the sump or crankcase in the case of wet-sump engines. When cases of this type are encountered, it is advisable to contact the engine and aircraft manufacturers and to follow their specific recommendations.

Starting

It is considered good practice in all weather conditions to pull the engine through by hand a few turns prior to starting, in order to avoid damage due to an accumulation of oil in the com-

bustion chambers during storage. In radial engines it is sometimes necessary to drain oil from the lower cylinders by removing the spark plugs. During cold weather periods, it should be pulled through several more times, to free the various bearing surfaces which may have become "frozen" due to the low-temperature congealed oil. This should be done even if the oil has been preheated.

Ignition

Starting, at all times, and particularly in cold weather, can be improved through additional diligence in the maintenance of the ignition system. Care should be taken to inspect regularly and check magneto points, ignition wiring, and the condition of the spark plugs, to insure that the maximum spark intensity is obtainable. When the aircraft is stored outside the hangar, suitable waterproof engine covers should be used to prevent the entrance of rain, snow, or ice into the engine compartment. Moisture in the ignition system and plugs may cause difficult starting or erratic operation, or both.

Carburetor Heaters

Carburetor intake air heaters should be carefully inspected to see that they are not burned through or excessively thinned out, because of heat erosion or corrosion, or cracks. A failure of the heater walls will allow the exhaust gases to pass back into the intake system and result in unsatisfactory operations or loss of power, and possibly a fire. The heat control valve should be checked to determine if it effectively closes off all cold air flow into the induction system when the valve is set at "full hot." In most low-powered engine intake air heaters, an improper closing of the valve will result in almost complete loss of intake air preheating efficiency, and the aircraft will be a potential hazard to the pilot under icing conditions.

A thorough explanation of the application of carburetor heat was included recently in the Certificate and Inspection Release No. 60, covering SOME PRESENT-DAY PROBLEMS IN LIGHT AIRPLANE ENGINES

Cabin Heat

Unless the pilot is warmly dressed or the cabin properly heated, or both, his nervous system and reactions will be slowed down considerably. Under certain "tight" flying conditions, a loss in pilot efficiency due to cold may be the

(See WINTER FLIGHTS, page 15)

U.S. Airline Progress



MILES FLOWN

1940



Each Symbol = 15,000,000 Miles

1941



PASSENGERS CARRIED

1940



Each Symbol = 300,000 Passengers

1941



MAIL CARRIED

1940



Each Symbol = 2,000 Tons

1941



EXPRESS CARRIED

1940



Each Symbol = 1,000 Tons

1941



Year End

(Continued from page 1)

months to two years. A total of 257 pilots, 18 aeronautical administrative engineers, 87 instructor mechanics, and 120 airplane service mechanics, each pledged to a career in commercial aviation, will be trained. The program is expected to begin shortly after the first of the year.

Pilot training will be given under the supervision of the Army Air Corps and the Civil Aeronautics Administration.

Another gesture of Latin American cooperation was a five-months' inspection trip conducted by one of the staff of the C. A. A. During this trip, medical examiners were designated in each country visited and arrangements were made for immediate examination of applicants for the Inter-American Aviation Training Program.

Air Transportation

Airline activity also reflects the impetus of defense, with its need for speedy transportation. Some 4,500,000 passengers were carried, against 3,185,278 in 1940, while distance flown increased from 119,517,263 miles in 1940 to about

150,000,000 miles in 1941. The fatality rate per 100,000,000 passenger-miles, however, declined from 3.05 passengers to 2.20. Included in the year's operations were 15,812,000 miles of flying by American lines on routes outside of continental United States, compared with 10,716,827 miles in 1940.

Rush calls for items needed in defense production helped boost volume of air express from 14,188,178 in 1940 to better than 22,500,000 pounds in 1941, and air mail carried totaled 45,450,000 pounds compared with 33,800,000 in 1940.

Airports

The C. A. A.'s first airport program got underway during the year with 385 defense landing areas designated for construction or improvement by a board consisting of the Secretaries of War, Navy, and Commerce. Funds of about \$140,000,000 were involved, with a Presidential request for an additional \$57,865,300 before Congress. At the end of 1941, the Nation's airports numbered 2,453, compared with 2,331 in 1940. They were divided as follows: 1,082 municipal; 901 commercial; 31 private; 78 Army; 38 Navy; 40 miscellaneous Government; 283 C. A. A. intermediate. Improvement of the airport picture is

also noticeable in the fact that there are now 64 Class 4, or top-notch airports, against 23 in 1940, while the number of Class 1 airports, those with minimum facilities, has dropped from 1,641 to 1,501. Class 4 airports are suitable for operations of both heavy bombers and airline transports.

Meanwhile, however, the usual program of airport construction which had been made possible by allotments from the Work Projects Administration and other Federal agencies, as well as contributions from local sponsors, continued during 1941. As directed by the Civil Aeronautics Act, each such airport project, before approval by the W. P. A. authorities, was first certified by the Administrator, following study, recommendations, and approval from an aeronautical standpoint, as reasonably necessary in air commerce or for the national defense.

During the calendar year 1941, the Administrator issued 490 Certificates of Air Navigation Facility Necessity authorizing the expenditure of approximately \$107,000,000 in Federal funds, including WPA, PWA, NYA, CCC, and War Department (Civil Projects). In addition approximately \$23,000,000 in CAA funds and \$46,000,000 in sponsors' pledges were involved in these projects.

Federal Airways System

To serve the mounting volume of commercial and military traffic, the Federal Airways System was extended and improved. At the end of the year, there were in operation 32,487 miles of lighted airways, equipped with radio course signals (known as radio ranges), communications and weather-reporting facilities, and emergency landing fields.

Traffic along these routes was separated and otherwise controlled from 14 C. A. A. centers, which recorded 1,628,400 aircraft operations during the year, a gain of 45 percent over 1940. New control centers at Memphis and Jacksonville were completed during 1941, with 7 additional centers planned for 1942, at San Antonio, Tex.; Boston, Mass.; Kansas City, Mo.; Denver, Colo.; Albuquerque, N. Mex.; Minneapolis, Minn.; and Great Falls, Mont.

The growing volume of traffic occasioned a ruling during 1941 that all craft flying the airways above 3,500 feet must be equipped with two-way radio.

Another step to insure safe movement of aircraft during the emergency was the passage of legislation authorizing the C. A. A. to establish or take over operation of control towers at airports where there is both civilian and military flying. This work is already under way.

To improve weather-reporting service, an additional 24,000 miles of teletype lines were leased, bringing the total to 55,790 miles, in addition to the 10,360 miles used exclusively for traffic control.

Ultra-high-frequency radio ranges, which transmit with virtually no interference, were put into operation along the New York-Chicago airway as a service test system. Instrument landing systems operating in the U-H-F band were being installed at Washington and Atlanta, with five more being manufactured for use at New York, Cleveland, Chicago, Kansas City, and Los Angeles.

Safety Regulation

In the field of safety regulation, C. A. A. inspectors made 50,000 examinations of planes and 200,000 of pilots, instructors, mechanics, and other aviation personnel seeking C. A. A. certificates. In order to give prompt service despite the 50 percent increase in inspection activity over 1940, 625 qualified men in the industry were designated as flight examiners and 125 as aircraft inspection representatives.

Aviation Medicine

The Aviation Medical Division conducted an estimated 172,500 physical examinations, which included 95,500 students and 11,000 applicants for the Secondary C. P. T. P. course.

Shortly before the end of the year, it was decided that the physical examination heretofore administered only to Secondary trainees would be extended to all applicants for C. P. T. training. This action resulted in the addition of some 400 medical examiners in the field.



New Board Policy Cancels Hearings

The Civil Aeronautics Board has announced a new general policy for the immediate future in its handling of proceedings involving applications for new air carrier certificates of public convenience and necessity or for the amendment of existing certificates.

The Board stated: "In order that the immediate and maximum attention of air carriers and their personnel and of the Civil Aeronautics Board, as well as of other Government agencies concerned, may be available for the most efficient discharge of the emergency demands growing out of the war upon which we are now engaged, the Board has decided that no hearings or prehearing conferences will be assigned on applications pending. Where dates have already been set, hearings will be postponed indefinitely and where final decisions by the Board are pending, no further steps will be taken after December 13. Hearings may, however, be assigned on certain applications or some pending cases carried to a decision if the Board finds that the national interest may require early inauguration of the services involved. Rate cases will be continued under an amended procedure, designed to minimize the burden which such cases impose upon operating organizations."

The new policy, the Board said, will remain in effect for such period of time as may appear to be appropriate in the light of existing conditions and their future development.

Houston Standardization Center

Early in the year there was established at Houston, Tex., a Standardization Center for flight and maintenance supervisors of the Civilian Pilot Training Program and inspection personnel of the C. A. A. The new center brings together all regular standardization equipment of the C. A. A. in the fields of instrument and air transport flying and pilot training.

Inspectors from all over the United States are sent to the new center each year for a period of standardization work to keep them abreast of the newest developments and practices, and key personnel of the industry is admitted to a greater extent than formerly. The expanded facilities also make possible uniform standards for supervisors of the Civilian Pilot Training Service throughout the Program.

American Export Denied Approval of TACA Purchase

The Civil Aeronautics Board has denied the application of American Export Airlines, Inc., for approval of the acquisition of TACA, S. A. (a Panamanian holding company). Through subsidiary companies, TACA conducts air transport services in Honduras, British Honduras, Costa Rica, Panama, Nicaragua, and El Salvador. The company is owned by Lowell Yerex, a British subject living in Honduras.

Under the Civil Aeronautics Act it is necessary for a carrier, other than an air carrier, but which owns or operates an air carrier, to prove that the use of the aircraft of that carrier is assisting the parent company in its service to the public. American Export Lines, Inc., the parent company of American Export Airlines, Inc., is a steamship line operating between New York and Lisbon, and between New York and India and Burma, via the Cape of Good Hope. The Board stated, "the steamship company * * * does not now, nor does it intend in the foreseeable future, to operate to any port in Central America. The record will not support a finding that the steamship company will use TACA's aircraft in any way in its operations. Thus, we must find that we cannot approve the proposed acquisition of TACA by the applicant."

The Board added: "This conclusion, however, is not to be construed as a disapproval of acquisitions by qualified American air carriers of companies of the type involved in a case where the applicable provisions of the act have been fully satisfied."

Pan American Airways, Inc., which operates through the same countries, intervened.

Washington National Airport

On June 16, the Washington National Airport was placed in operation, approximately 2½ years from the time construction was begun. Since that time, almost 300,000 air line passengers have enplaned or deplaned at the airport, and scheduled air-carrier operations reached a high of 192 daily in the month of September.

Spectator interest has remained very high and up to the first of December over 2,225,000 persons have visited the airport, with some 400,000 passing through the turnstiles onto the observation terrace.

Danger of Carburetor Icing Explained, Rules Suggested in Safety Bulletin

In the December 1 issue of the CIVIL AERONAUTICS JOURNAL there was printed a resume of ICING OF AIRCRAFT, a safety bulletin written by B. C. Haynes, air safety specialist in meteorology, and issued by the Civil Aeronautics Board's Safety Bureau. The following is a similar resume of a safety bulletin on CARBURETOR ICING AND PREVENTION written by Alexander N. Troshkin, powerplant specialist for the Safety Bureau of the C. A. B. While space does not permit the printing of the entire bulletin, it is felt that the "Operating Rules" suggested by Mr. Troshkin are of such practical value as to warrant their printing in full. Copies of the bulletin may be obtained from the Publications and Statistics Division, Civil Aeronautics Administration, Washington, D. C.

Carburetor Icing and Prevention

By Alexander N. Troshkin
Powerplant Specialist, Safety Bureau

The effect of ice on the operation of the powerplant is perhaps far more insidious than on the aircraft. The formation of ice on the wings in most cases is visible to the pilot. With the exception of more or less unusual conditions, there is a wider time interval elapsing before the accumulation is large enough to affect seriously the aerodynamic characteristics or safety of the aircraft as compared with the rapid formation of carburetor ice.

Carburetor or induction ice is not visible to the pilot. The first indication of icing is a loss of power with the loss increasing at a rapid rate. It is possible to have the power seriously affected in less than a minute after the ice accumulation has started.

Carburetor icing under certain conditions can occur when the atmospheric temperature is as high as 80° F., although generally it is encountered only between 20° F. and 65° F., when accompanied with a high relative humidity, rain or overcast. Below 20° F. the danger of ice formation is less because the quantity of water vapor in the air is slight.

Caution Essential

The element of surprise attendant to carburetor icing makes it essential that the pilot be conversant with icing conditions and icing symptoms. The ice formation should be allowed to start, but in the event that it does it must be checked and eliminated in its early stages. After a severe loss in power it is almost impossible to check further formation or eliminate the ice unless the aircraft is equipped with de-icing mediums other than heat.

Carburetor icing is not a mysterious occurrence but is the result of after-

math of the changes taking place within the carburetor during the course of its intended operation. The carburetor, in performing its function of metering fuel and air under various engine operating conditions, induces the following changes in the fuel and intake air which contribute to the refrigeration of the mixture: (1) Vaporization of the liquid fuel, (2) changes in intake air and mixture velocity and consequently pressure, (3) evaporation of moisture or water entrained in the intake air. Of all these factors, the vaporization of fuel contributes the greatest by far to the refrigeration of the mixture and is always present regardless of atmospheric conditions with respect to moisture, water, etc.

Temperature Drop Results

The vaporization of the liquid fuel requires heat and this heat is drawn from the intake air. The temperature drop due to vaporization of the fuel may be as much as 40° F. The total drop due to all three of the influencing factors may be as much as 60° F. With these possibilities in mind, one can readily understand that even during summer operations the temperature in the carburetor at the throat, throttle, or the adapter can be at 32° F. or lower, and if at the same time the atmosphere has a relatively high humidity or the plane is flying through clouds or rain, an ice formation will occur.

The most common means of preventing and removing ice formation is heat. No ice can form in the carburetor providing the mixture temperature is held above 32° F., and preferably in the region of 35° F. to avoid making the temperature condition too critical. In engine installations equipped with mixture temperature indicators the pilot can be guided by temperature and r. p. m. or manifold pressure. The intake air temperature required to prevent icing varies somewhat with the type of engine and the installation. No matter where the temperature indicator is located, it is essential that either the manifold pressure gauge or the r. p. m. be watched when the outside air temperature is at 70° F. or lower.

Where no temperature indicators are installed, as is the case with most low-powered airplanes, it is advisable to operate with carburetor heat "full on" when the atmospheric temperature is 70° F. or lower.

Operating Rules

Carburetor icing can be avoided providing the heating system is adequate, carefully serviced and maintained, and properly used by the pilot. Just a few common sense rules need be followed in order to stay clear of engine icing.

1. Be "ice-conscious" whenever the temperature is 70° F. or below.

2. Make certain that the intake air preheater is in proper working condition.

Check the preheater for cracks and burning through due to heat erosion.

Make certain that when the heat control is at "full hot" the valve completely cuts off the entrance of cold air into the induction system.

3. Keep the heat control at "full on" when the atmospheric temperature is at 70° F. or less, or maintain a mixture temperature at not less than 35° F., or maintain intake air temperature at 75° F. (provided the manufacturer advises that this is sufficient to maintain a 35° F. mixture). Always use full heat on all low-power aircraft not equipped with mixture or intake air temperature indicators, except during take-off.

4. With some engine installations, the available intake air heat may be far greater than that necessary to prevent icing. The continuous use of excessive heat may result in a serious loss in power, engine overheating, detonation and possibly damage to the engine. Under these conditions be guided by the temperature indicator in the application of heat.

5. Remember that loss of power means loss in heat available for de-icing and ice prevention. The effect is cumulative. The reduction in heat available may be great enough to make it impossible to remove the ice formed or prevent any further formations and, therefore, result in a complete power loss.

6. From the icing standpoint, it is inadvisable to operate at reduced throttle settings over prolonged periods when icing conditions exist.

7. Avoid flying through rain or overcast when the temperature is at 70° F. or less, unless the aircraft is equipped with adequate engine anti-icing or de-icing equipment.

- Keep 'Em Flying -

Portable Metal Landing Field

A portable metal landing field for American warplanes was installed recently by the Army during southern maneuvers. Perforated steel strips one-eighth of an inch thick, 16 inches wide, and 10 feet long were laid and locked together on a sandy meadow, forming a runway 150 feet wide and 3,000 feet long.

Consultant Appointed

Appointment of Bruce K. Brown of Chicago as a consultant on aviation gasoline problems has been announced by Defense Petroleum Coordinator Harold L. Ickes. Mr. Brown has spent many years in the chemical industry; in recent years he has specialized in the technical, patent, and commercial development of new petroleum refining processes, including some of those used in aviation gasoline manufacture.

Air Hazard Created By Foreign Matter In Induction System

The following is a condensed version of a safety bulletin, "Foreign Materials In the Induction System," issued by the Safety Bureau of the Civil Aeronautics Board. A copy of the full bulletin may be obtained from the Publications and Statistics Director, Civil Aeronautics Administration, Washington, D. C.

The potential hazard of foreign material entering the power plant induction system cannot be too forcibly brought to the attention of the aircraft operating personnel. Materials entering the system may not have an immediate effect on the operation of the engine but during the course of service the material may pass into the blower system and cause serious damage to the impeller and possibly result in a power plant failure.

Although no substantiating evidence is available, it is possible that some engine failures attributed to broken valves or piston heads may have had as a primary cause the entrance of bolts, nuts, cotter pins, etc., into the induction system which in passing through the combustion chamber damaged the valve or piston. Rags, paper, etc., have been known to cause a serious loss of power when during the course of operation they have become lodged in the vicinity of the carburetor jets or throttle.

Work Material Left

The most common causes of this type of power plant difficulty have been the mechanic's failure to remove work ma-

Special Notice

Prohibition of flight over Army and Navy installations.—Fliers are warned to avoid flight over any Army or Navy field, fort, camp, or other installation, or over any ammunition depot, powder and ordnance plants, etc. Planes approaching these areas may be fired upon without notice. Typical warnings received by telegraph follow:

"Any planes flying over Portsmouth, N. H., will be considered enemy planes and will be fired upon."

"All aircraft to avoid the Parker Dam (Arizona) area. If aircraft approach this area, they will be fired upon."

"All planes flying at low altitude over Fort Ord will be fired upon."

"All aircraft approaching Morrison Field, West Palm Beach, Fla., contact control tower 20 minutes out on 3105, 4495, 4595, kcs. Any airplane failing to do so will be considered hostile."

Pilots, when their certificates have been renewed, should exercise a high degree of discretion in the planning and execution of cross-country flights.



terial from the vicinity of the scoop or cowl upon completion of the engine services and accidentally dropping material into the induction system when removing or replacing the scoop and other parts of the system. Other difficulties are attributed to the taking in during a warming-up period of such objects as rags, paper, etc., which may be lying on the ramp or runway.

A study of typical cases substantiates the conclusion that most of the foreign materials are introduced during the servicing of the power plant. Nearly all air carriers have issued strict instructions regarding maintenance procedure when working on or near the

(See INDUCTION SYSTEM, page 15)

Board Takes Action Against 21 Pilots

The Civil Aeronautics Board revoked or suspended the certificates of 21 pilots in October, it was announced in a recent Safety Bulletin issued by the Board. Five commercial, private, and student pilots were grounded for flying in the District of Columbia airspace reservation, a violation of the Civil Air Regulations, while 16 more had certificates either revoked or suspended for various violations.

"Drastic action by the Board was necessary to impress upon airmen the necessity for compliance with regulations," the bulletin stated.

The Board revoked four student and two private certificates for serious violations. The four students had carried passengers other than certificated instructors. One of them had dual controls operative. Two others navigated their planes on a civil airway. One of these flew at an altitude of less than 1,000 feet. The other acted as a pilot while his passenger dropped handbills without a waiver to cover such action.

A private pilot flew over the congested area of a city and an open air assembly. In both cases, altitudes flown were less than 1,000 feet. Another pilot carried passengers in a control seat. Duals were operative and neither pilot nor passengers had appropriate ratings. The pilot also made false statements in his application for a commercial certificate.

"Flying over airspace reservations is a flagrant violation of Civil Air Regulations," the bulletin warned. "Study these regulations; they have been compiled by men with years of aviation experience. They are for the good of aviation, the public, and the pilots. Their purpose is to make flying safe."

Board Issues New Defense Rules for Private Flying

Defense regulations for the control of private flying have been issued by the Civil Aeronautics Board. Although civil pilot certificates were suspended on December 8 by the Administrator of Civil Aeronautics, grounding all civil pilots except those operating scheduled air carrier aircraft, provisions have since been made for the reinstatement of those certificates after determining that each applicant is a citizen of the United States and after investigation of his character and loyalty to the United States.

For this reason the Board issued the new regulations having as their purpose the control of civilian flying both for the protection of such flying and for the prevention of sabotage and espionage by civil aircraft. There are at present 94,080 licensed civil pilots and 98,133 students who will be graduated by spring 1942.

Identification Required

The regulations forbid owners of aircraft to permit any other person to operate them unless the owner has actually examined the pilot certificate of the person desiring to use the aircraft and has secured proper identification. After January 8, 1942, all pilots will be required to carry identification cards containing their fingerprints, picture, and signature. In addition, before taking off from any airport, a pilot must present his pilot certificate and identification card to the police officer or other authorized person at the airport and secure clearance for his proposed flight. In doing so, he must also file a statement identifying the aircraft and setting out a detailed plan of his flight.

The carriage of baggage, cargo, and cameras in aircraft other than those on established air lines was also restricted. Baggage and cargo can only be carried if it has first been thoroughly searched by the pilot or by someone he designates, and cameras must be made inaccessible to the passengers. The established air lines have already taken certain steps of this character, and the Board has under consideration further emergency regulations.

The text of the regulations is carried on page 14 of this issue. (See Amendments 20-23, 60-48, 60-49, 60-50.)

—Keep 'Em Flying—



Make Sure Aircraft Is Airworthy Before Take-off, Warning

Both pilots and mechanics were cautioned in a recent safety bulletin issued by the Civil Aeronautics Board to make certain that an aircraft is airworthy before it is flown. Aircraft undergoing repairs or adjustment should be plainly marked, the bulletin suggested. Full text of the bulletin follows:

Aircraft Undergoing Repairs or Adjustment

To Pilots:

Make certain that your aircraft is airworthy before you fly it.

Recently, suspicion pointed to the probability that a fatal accident was caused by an airplane being flown acrobatically before certain mechanical work was completed.

There was no way for the pilot to know that work was in progress except by close inspection.

The mechanic wasn't there to tell the pilot not to fly it.

Always make certain that aircraft are safe to fly before you take off.

To Mechanics:

Your Position Is One of Trust! Never Leave an Unfinished Mechanical Job That Might Render an Airplane Unsafe to Fly Without Tagging It! A Tag Marked "Grounded" (Preferably Red) Attached to the Ignition Switch Should Remain There Until the Airplane Is Again Airworthy.

Keep Aircraft Grounded Until They Are Airworthy!!

INDIVIDUAL ACCIDENT REPORTS

Stall During Crop Dusting

Frank P. Lawrence, jr., was seriously injured in an accident which occurred on August 7, 1941, near Matamora, Ohio. He held a commercial pilot certificate with Class 1, Land and 2S Land ratings and had accumulated about 327 hours of flying time. The aircraft, a Model ASO Waco, was demolished.

About 6:40 p. m. the pilot took off solo from a pasture about 2 miles south of Matamora for the purpose of dusting a tomato field located about 1½ miles away. The pilot arrived at the field and completed four dusting runs across

it. At the conclusion of the fourth run, he pulled the aircraft up rapidly and entered a steep left turn at an altitude of about 150 feet. During this turn witnesses noted that the engine misfired intermittently but resumed normal operation and that dust continued to be discharged from the aircraft. Near the completion of the turn the aircraft was stalled and fell to the ground on its left wing and nose.

Subsequent investigation revealed no evidence of failure of the control system or structure, or of malfunctioning of the engine. The dust hopper contained 560 pounds of copper sulphate; with this load the aircraft was still within its certificated standard weight limit. The fuel was not exhausted. The condition of the propeller revealed that the engine was developing considerable power at the time of impact. The pilot subsequently stated that it was his practice to retard the throttle slightly as he started his descent immediately following the turn. This could account for the misfiring of the engine; all the evidence indicates that the misfiring was temporary and that the engine was operating normally when the crash occurred. The statements of witnesses and the copper sulphate on the ground revealed that the dust hopper gate was open during the turn. The pilot stated that he had experienced difficulty in closing the hopper gate on previous flights, but, because of his injuries, he could not recall details of the subject flight.

The hopper mechanism and its controls were damaged to such an extent that it was impossible to determine their condition prior to impact. From the foregoing, it appears that the hopper gate opened during the turn, releasing the dust, and that when the pilot attempted to close the gate his attention probably was diverted from the operation of the aircraft which became stalled. It is further believed that a temporary loss of power together with the existing atmospheric condition (temperature of 95° and wind calm) may have contributed to the cause of the stall.

Probable Cause.—Stall during a steep turn at low altitude.

Contributing Factor.—Malfunctioning of the dust-releasing mechanism.

Carelessness Causes Collision in Air

The Civil Aeronautics Board has reported upon the investigation of an accident near Hector Airport at Fargo, N. Dak., on November 1, 1940, when two aircraft collided in the air. The aircraft involved were a Piper, Model J-4, and a Waco, Model UPF-7. Both aircraft, which were being operated in con-

nection with the Civilian Pilot Training Program, received major damage.

The Piper was flown by Jerome Peterson, who held a commercial certificate with 1 Land, 2S Land, and instructor ratings, and who had a total flying time of 203 hours. The pilot was seriously injured, while his passenger, William Smith, who held a student certificate and had had about 6 hours dual instruction, was fatally injured.

The pilot of the Waco, Harold Eddy, had completed a primary course under the Civilian Pilot Training Program and was a student in a secondary course under that Program. He held a private pilot's certificate and had logged about 27 hours solo flying time. He was fatally injured.

The two aircraft were approaching the airport from the southeast at an altitude of approximately 200 feet in an effort to land toward the northwest. The Piper, in a straight glide, was about 1,000 feet southeast of the southeast corner of the airport while the Waco, slightly behind and above it to the west, was completing a normal left turn. The Waco, in maneuvering for its approach entered the glide path of the Piper and, because of the Waco's faster glide and more rapid descent, it crashed into the Piper from above. The right wheel of the Waco struck the fuselage of the Piper and settled into it, and the propeller of the Waco dug into the engine cowl of the lighter plane. After the aircraft had become thus entangled, they dropped straight down, the Waco on top of the Piper.

Investigation disclosed that neither the Civilian Pilot Training Program operators nor other operators at this airport had a formulated traffic procedure. Investigation also revealed that both aircraft were operating satisfactorily prior to the collision.

Probable cause.—Carelessness of the pilot of the Waco in failing to observe and avoid another aircraft while approaching for a landing.

Contributing factors.—(1) Inexperience of the pilot of the Waco. (2) Lack of local traffic regulation.

Stalls in Sharp Turn for Precautionary Landing

In an accident near Lexington, Nebr., on January 7, 1941, Max L. Jones, a private pilot with a 1 Land rating who had a total of 215 solo hours, was seriously injured. The aircraft, a Luscombe Silvaire, was severely damaged.

The pilot was engaged in a solo, cross-country contact flight from Grand Island, Nebr., to Cheyenne, Wyo. Weather conditions along the route were excellent except for a reported light ground fog at Overton, Nebr. The aircraft entered this fog near Eddyville, Nebr. After a short while the pilot, realizing that both ceiling and visibility were below the minimums prescribed by regulation and that the weather was rapidly becoming worse, decided to land. He selected a site and started a sharp left turn for an approach. During this

turn the aircraft stalled and fell to the ground, striking first on its left wing.

Immediately after the accident, it was discovered that during flight, ice of moderate thickness had formed on the leading edge of the wings and on struts. There was no evidence of failure of the control system, of the structure, or of the power plant.

Probable cause.—Stall during precautionary landing.

Contributing factor.—Ice on leading edge of wings.

Plane Dives Into Lake Following Steep Turn at Low Altitude

Pilot James Plunkett and his passenger, Glenn R. Dell, were fatally injured in an accident at Jackson Lake, Ga., on September 15, 1940. Plunkett held a private pilot certificate with 1 Land and 2S Land ratings, and had accumulated 175 solo flying hours. Dell held a student certificate. The aircraft, a Culver Cadet, Model LCA, received major damage.

The pilot, accompanied by his passenger, took off from Candler Field, Atlanta, Ga., on a cross-country flight to Jackson Lake. The aircraft, approaching from the northwest, arrived over Jackson Lake about 1:55 p. m. After a circle of Jackson Lake Inn, located on the shore of the lake, the pilot flew over the airport and back to the Inn. He then proceeded up the lake shore to a point opposite the airport where, at an altitude estimated as 300 feet, a steeply banked left turn was started. At this point the aircraft stalled and dove into the lake with power on.

No failure of the control system or structure and no malfunctioning of the engine were evidenced by subsequent investigation.

Probable Cause.—Pilot stalled the aircraft at an altitude too low to permit recovery.

Failure to Maintain Flying Speed in Bad Weather During Approach to Airport

An accident at Okeechobee, Fla., on January 18, 1941, resulted in the serious injury of L. D. Martin, a student pilot who had logged about 30 hours solo flying time. His airplane, a Luscombe, Model 8C, was demolished.

The pilot left Sebring Airport, Sebring, Fla., on a cross-country flight to Okeechobee, about 40 miles away. He encountered a very heavy local rain and gusty wind in the vicinity of Okeechobee, but attempted a landing on the airport despite the adverse weather. During the final part of his approach he stalled the aircraft at low altitude near the edge of the airport and it fell off and struck the ground on the nose and right wing.

Investigation disclosed no evidence of failure of the control system or structure or of malfunctioning of the engine. It was ascertained that the pilot had not previously flown in heavy rain, and

that he was particularly anxious to reach his destination to attend a business conference.

Probable cause.—Failure of pilot to maintain flying speed during an approach in heavy rain.

Contributing factors.—(1) Obstructed vision from the cockpit. (2) Inexperience of the pilot.

Turn at Low Altitude

An accident near Portsmouth, Ohio, on June 13, 1941, resulted in serious injuries to the pilot, George Bahner, and to his passenger, Carl Miller. The pilot held no type of airman certificate, but stated that he had flown about 450 hours. The aircraft, a Model C-3 Aerona, was demolished.

About 5:50 p. m., Bahner, accompanied by Miller, took off on a local pleasure flight from a pasture near Portsmouth. After proceeding in the direction of the take-off for a mile or two, the pilot made a 180° left turn and flew along the east side of the pasture at an altitude of 200 or 300 feet. During this portion of the flight Bahner zoomed the aircraft two or three times. About 1,500 feet north of the field, he made a steep left turn of about 180°, apparently in order to approach for a landing. When he attempted to recover from the turn, the aircraft was stalled at an altitude of approximately 75 feet. It fell off to the left and crashed to the ground on its left wing and nose.

Investigation disclosed no evidence of failure of the control system or structure and no evidence of malfunctioning of the engine during the flight. The breakage of the propeller indicated that power was being developed at the time of impact. The fuel had not been exhausted. Bahner had flown the aircraft on several local flights, totaling about 2 hours, on the day of the accident.

Probable Cause.—Failure of pilot to maintain sufficient flying speed during a turn at low altitude.

Strikes Tree During Take-off

An accident at Elmhurst, Ill., on August 7, 1941, resulted in serious injuries to the two occupants of a Model A Taylorcraft which was extensively damaged. Mrs. Virginia S. Cook, the pilot, held a private pilot certificate with a Class 1 Land rating and had accumulated approximately 271 solo flying hours. Her passenger, Miss Irene Laszewski, held a student pilot certificate.

The pilot, accompanied by the passenger, arrived at the Skyhaven Airport at Elmhurst early in the morning. After checking the weather, which was excellent, they fueled the aircraft and prepared to depart for Springfield, Ill., where they intended to join the Illinois Air Tour. The pilot, seated in the left-hand seat, took off in a south-southwest direction. She subsequently stated that although the motor seemed to be functioning properly, the aircraft was slow in leaving the ground and did not climb rapidly. At an altitude of about 20

feet, the left wing of the aircraft struck a tree on the western end of the southern boundary of the field. The impact swerved the plane to the left and it fell to the ground on its left wing and nose. It bounced about 6 feet and came to rest in an inverted position.

Examination of the wreckage disclosed that the aircraft was airworthy prior to impact with the tree. There was no indication of malfunctioning of the power plant. The pilot had utilized all the available length of runway, about 1,200 feet. The tree which the plane struck was about 30 feet tall. On the pilot's right, there was an open space which extended for about 150 feet and on which there were no obstructions higher than 10 feet.

Probable Cause.—Failure of the pilot, during take-off, to observe an obstruction in time to avoid striking it.

Spin Follows Intentional Stall

An instructor and her student were seriously injured in an accident at Norwich, N. Y., on July 21, 1941. The instructor, Sally E. Knapp, held a commercial pilot certificate with 1 Land and 2S Land and instructor ratings and had accumulated approximately 250 hours flying time. The student, Paul O'Connor, had received 6½ hours dual instruction. The aircraft, a Model J-3F-50 Piper, was extensively damaged.

After reaching an altitude of 1,500 feet on a routine instruction flight, the student was given coordination exercises, stalls with power, and stalls without power. At an altitude of about 800 feet, the aircraft was intentionally stalled with power on. During the maneuver the left wing dropped and the student applied full right rudder with the stick back, whereupon the plane fell into a right spin. The instructor's efforts to effect recovery were only partially successful and the aircraft struck the ground on its left wing and nose at a fairly flat angle and with very little forward speed.

Investigation revealed no evidence of failure of the control system or structure or of malfunctioning of the engine. The weather had no bearing on the accident. Miss Knapp, who had accumulated only about 15 hours as an instructor, subsequently stated that the student froze the controls.

Probable Cause.—An intentional stall, followed by an inadvertent spin from which recovery was not effected.

Contributing Factors.—(1) Action of instructor in giving instruction in stalls at a low altitude. (2) Instructor's limited experience as an instructor.

Altitude Misjudged in Landing

Serious injuries were sustained by the captain and minor injuries were sustained by three other crew members in an accident which occurred on June 26, 1941, in the Harbor of Rio de Janeiro, Brazil. The flight personnel consisted of Captain Walter Jackson Garrison, Captain James Edward Anderson, Jun-

(See ACCIDENTS, page 15)



C. A. A. Will Train Airport Traffic Control Operators

Establishment of seven centers for training airport and airway traffic control operators has been announced by Donald H. Connolly, Administrator of Civil Aeronautics, as the C. A. A. prepared to take over additional airport traffic control towers. The training will take place at New York, Atlanta, Chicago, Fort Worth, Kansas City, Santa Monica, and Seattle.

Eight towers were put under C. A. A. management during November and 19 will be taken over during January. Funds are available for C. A. A. management of 12 others to be taken over at a later date. Locations will be selected from a list certified by the Secretary of War or the Secretary of the Navy.

C. A. A. control of traffic at airports was directed by Congress at the request of the War Department and has been accomplished with the consent and co-operation of the municipalities concerned. Growth of military flying on many of these fields presented a problem in traffic control which was best solved by the C. A. A. acting in the interest of both civil and military aeronautical development. In addition, control of traffic at airports by C. A. A. personnel unifies and improves control of all traffic on the airways network, which is the province of the C. A. A.

Theory and Practice

Classrooms will be designated by the C. A. A. regional managers in the seven cities concerned. Initial training will consist of four weeks theory to be followed by practice in the operation of an airport control tower and the supervision of air traffic into and out of an airport. Applicants must possess a private pilot's certificate, or one of higher grade. The experience requirement is 18 months of actual experience in the field of air traffic control, or high school or college education as a substitute for the experience. If an applicant has had no actual experience, he may substitute 1 year of such educational experience for each 3 months of actual experience required. Thus an applicant with as much as 2 years of college training need not have had previous air traffic control experience. Salary will be \$1,800 for the first 6 months, with advancement to \$2,000 upon satisfactory completion of this trial period.

C. A. A. traffic control went into effect during November at the following airports:

Albuquerque, N. Mex., Atlanta, Ga., Charlotte, N. C., Jackson, Miss., Orlando, Fla., Portland, Oreg., Salt Lake City, Utah, Savannah, Ga.

The following will be put under C. A. A. control during January, 1942:

Birmingham, Ala., Boston, Mass., Buffalo, N. Y., Indianapolis, Ind., Jacksonville, Fla., Long Beach, Calif., Kansas City, Mo., Los Angeles, Calif. (Mines Field), Louisville, Ky., Memphis, Tenn., Miami, Fla., Nashville, Tenn., Newark, N. J., St. Louis, Mo., San Diego, Calif. (Lindberg Field), Seattle, Wash. (Boeing Field), Spokane, Wash., Tampa, Fla., Wichita, Kans.

Qualified personnel on duty in towers being taken over will be offered employment by the C. A. A. on a probational basis.

—Keep 'Em Flying—

Flight Strips Planned Along Public Highways

The Army Air Forces will cooperate with the Commissioner of Public Roads in the selection of locations and construction of "flight strips" along public highways, the War Department announced recently. Construction of these auxiliary landing areas is authorized by the Defense Highway Act of 1941, which has been signed by the President.

In most instances, construction of the flight strips will involve little more than widening the highway rights-of-way or the use of roadside development areas and establishment of a definite line of demarcation between highway and flight strip.

Flight Rules

(Continued from page 1)

scribed zones beyond a 10-mile radius from point of departure unless:

(a) Military or naval operations require it; or

(b) A flight plan has been filed with the appropriate military naval or civil operations office, and the following information has been submitted by that office to, and acknowledgment received from, the nearest Information Center:

- (1) Number of aircraft in flight.
- (2) Type of aircraft.
- (3) Point of departure.
- (4) Time of departure.
- (5) Route and altitude to be flown.
- (6) Destination.
- (7) Estimated time of arrival.

(c) Flights originating outside the prescribed Air Defense Zones, whose destination is within a zone, will be reported to the nearest Information Center by the operations office at the point of destination.

5. In event that tactical necessity requires dispatch of military or naval aircraft on operational missions before this procedure can be completed, the commander responsible will forward the identification report to the proper Air Corps Information Center with least possible delay, in order to avoid falsely alerting Air Defense Forces and endangering his own aircraft by friendly fire.

6. Air Corps Information Centers are established at the following places; additional ones will be added if and when necessary:

(a) East coast:

1st Interceptor Command.

Boston, Mass.

New York, N. Y.

Philadelphia, Pa.

Norfolk, Va.

3d Interceptor Command.

Wilmington, N. C.

Charleston, S. C.

(b) West coast:

2d Interceptor Command.

Seattle, Wash.

Portland, Oreg.

4th Interceptor Command.

Los Angeles, Calif.

San Francisco, Calif.

7. Messages should be addressed to the "Air Corps Information Center" at one of the addresses given above.

8. The operations office at point of destination will always advise the nearest Information Center of any flights which are at a substantial variance from their flight plans.

Airport Projects Approved

In accordance with the provisions of section 303 of the Civil Aeronautics Act, the Administrator of Civil Aeronautics has issued certificates of air navigation facility necessity, authorizing the expenditure of Federal funds in the operation of the following projects:

FLORIDA

Daytona Beach, Municipal Airport (WPA).....	\$126,799
St. Petersburg, Pinellas County Airport (CAA-WPA)-----	329,875

MICHIGAN

Sault Ste. Marie, Municipal Airport (WPA)-----	478,632 ¹
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NEW HAMPSHIRE

Claremont, Municipal Airport (CAA-WPA)-----	65,897 ²
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VIRGINIA

Roanoke, Municipal Airport (CAA-WPA)-----	325,391
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WASHINGTON

Winthrop, Inter-City Airport (U. S. F. S.)-----	8,000
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¹ This cancels and supersedes certificate for previous project.

² This will be superseded by a later certificate.

C. A. A. Report Basis For Final Decision On Airport Lease

Two letters prepared by the Civil Aeronautics Administration have been made the basis of a decision by the Department of the Interior affirming a decision of its General Land Office denying an application of the Chamber of Commerce of Ajo, Ariz., for renewal of a lease of 455 acres of public lands for public airport purposes.

On May 8, 1941, the C. A. A. transmitted the following report concerning renewal of this airport lease:

"This airport site has been inspected by one of our field representatives, and he reports that the land covered by this application is not suitable for airport purposes since its northwest corner is less than 1 mile from the southeast corner of a tract of land recently leased to the Board of Supervisors of Pima County for the development of a new airport under the airport program of the Civil Aeronautics Administration. When this project was initiated, the site covered by the old lease was inspected by one of our field representatives; and since it was found unsuitable for the development of a modern airport, the project was shifted to the new site. Consequently, it is the recommendation of the Civil Aeronautics Administration that this application for renewal of the old lease be denied."

Appeal Made

On the basis of this report, the Commissioner of the General Land Office denied the application for renewal, and when the applicant protested this decision, the following report was submitted by the C. A. A.:

"One of our field representatives has again inspected the subject site and has discussed the matter with the Pima County officials. According to his report, the new county airport can adequately serve both the civil and military needs of the community, and in view of the limited amount of civilian flying to be accommodated, the Army will probably not require the exclusive use of the airport. He reports, further, that in his opinion, the existence of two airports within 1 mile of each other would present a far greater hazard than the concentration of all local flying activity at the new county airport.

"On this basis, it is the recommendation of the Civil Aeronautics Administration that the appeal be denied."

In considering the protest of the Chamber of Commerce, which was treated as an appeal, the Assistant Secretary of the Interior on November 24, handed down the following decision:

"It appears from a consideration of all the evidence in this case that the denial of the application for renewal should be sustained. The question involved has been thoroughly considered by the aeronautical branch of the Gov-

Special Notice

Blackout of Air Navigation Aids.—

As a defense measure, all radio aids, rotating beacons, and other lighting facilities in the entire country, but primarily on both coasts, are subject to momentary or prolonged periods of complete shutdown without advance notice, both day and night. Exercise extreme caution.

ernment and the reasons given by that unit for denying a renewal of the lease appear to be paramount, in the interest of public safety and welfare, to the reasons advanced by the appellant for a renewal."

Aeronautical Charts

During November the following new editions of aeronautical charts were issued by the United States Coast and Geodetic Survey. Pilots are warned that the previous editions of the same charts are canceled and now are obsolete.

Regional and direction-finding (DF) charts are sold for 40 cents each, while sectional charts are 25 cents each. On orders grossing \$10 or more, a 33 1/3 percent discount is allowed. Copies of these charts may be obtained from the Coast and Geodetic Survey, Washington, D. C., and from recognized dealers at major cities and airports.

New Edition of Radio Direction Finding Chart

24-DF. October 1941. Size, 34 by 22 inches. Located in latitude 31°-41° N., longitude 104°-123° W., an area of about 650,000 square miles. Accumulation of changes since last edition included.

New Regional Aeronautical Chart

2-M. July 1941. Size, 23 by 38 inches. Located in latitude 44°-49° N., longitude 102°-114° W., an area of about 206,000 square miles. Covers the area on the following sectional aeronautical charts: Glacier Park Williston, Butte, Miles City, Yellowstone Park, and Rapid City. It is lithographed in 13 colors giving airports, names of airports, beacons, compass roses, isogonic lines, weather broadcast, etc., in red; radio ranges in pink; railroads and topographic features in black; water in blue; areas of cities in yellow, and gradients of elevation in 6 tints.

New Editions of Regional Aeronautical Charts

Fairbanks.—October 1941. Size, 37 by 32 inches. Located in latitude 61°30'-66°40' N., longitude 140°-157° W., an area of about 185,000 square miles. Radio range at McGrath and civil airways added.

Ketchikan.—November 1941. Size, 19 by 20 inches. Located in latitude 54°-58° N., longitude 130°-137° W., an area of about 50,000 square miles. Ketchikan radio range and civil airways added.

New Editions of Sectional Aeronautical Charts

Dubuque.—October 1941. Size, 20 by 41 inches. Located in latitude 42°-44° N., longitude 90°-96° W., an area of about 49,000

Air Corps Relaxes Education Rules

The Air Corps has made it possible for high school graduates to qualify as the nonflying officers who operate the War Department's secret bomb sight and navigate its long-range bombers.

Graduates of accredited high schools between the ages of 20 and 26 inclusive, who pass an Air Corps intelligence test, are being accepted for a joint navigator-bombardier training course recently established by the Air Corps, the War Department has announced. This course is expected to turn out 10,000 or more specialized combat crewmen by the end of 1942.

The Air Corps previously required its navigators and bombardiers to have at least 2 years' college training or be able to pass a special Air Corps examination.

Combining of the two courses also marked an innovation in Air Corps training, since previously navigators and bombardiers had been trained separately.

Divided into four stages, with new classes beginning every 3 weeks, the combined course is offered progressively at four locations and takes 45 weeks for completion. At the end of 39 weeks, qualified navigator and bombardier trainees are commissioned as second lieutenants in the Air Corps.

square miles. Rochester radio range added, Des Moines radio range realigned, and accumulation of changes since the last edition included.

Elko.—November 1941. Size, 20 by 42 inches. Located in latitude 40°-42° N., longitude 114°-120° W., an area of about 51,000 square miles. Includes an accumulation of changes since the last edition.

Green Bay.—October 1941. Size, 19 by 39 inches. Located in latitude 44°-46° N., longitude 84°-90° W., an area of about 47,000 square miles. Changes accumulated since the last edition included.

Klamath Falls.—November 1941. Size, 20 by 45 inches. Located in latitude 42°-44° N., longitude 120°-125° W., an area of about 30,000 square miles. Accumulation of changes since the last edition included.

Los Angeles.—October 1941. Size, 20 by 45 inches. Located in latitude 34°-36° N., longitude 114°-120° W., an area of about 55,000 square miles. Long Beach radio range and an accumulation of changes since the last edition added.

Minot.—October 1941. Size, 20 by 37 inches. Located in latitude 48°-50° N., longitude 96°-102° W., an area of about 45,000 square miles. An accumulation of changes since the last edition included.

Mobile.—October 1941. Size, 20 by 47 inches. Located in latitude 30°-32° N., longitude 72°-78° W., an area of about 51,000 square miles. Albany radio range added and accumulation of changes since the last edition included.

New York.—October 1941. Size, 20 by 42 inches. Located in latitude 40°-42° N., longitude 72°-78° W., an area of about 51,000 square miles. Wilkes-Barre radio range added and Poughkeepsie, New York, and Hartford radio ranges realigned.

San Antonio.—October 1941. Size, 20 by 43 inches. Located in latitude 28°-30° N., longitude 94°-20°-99°-40° W., an area of about 52,000 square miles. Includes an accumulation of changes since the last edition.

Savannah.—November 1941. Size, 20 by 46 inches. Located in latitude 32°-34° N., longitude 78°-84° W., an area of about 56,000 square miles. Changes accumulated since the last edition included.



Manufacturing and Production

Aviation Gasoline Manufacture Put on Wartime Basis

Centralized control of all of the nation's aviation gasoline by the Office of Petroleum Coordinator, as a means of insuring prompt and adequate filling of wartime needs, is provided in orders issued by that office, it was announced by Petroleum Coordinator Harold L. Ickes.

Provided, also, with approval of the Department of Justice, is authority for the oil companies, pursuant to the direction of the Petroleum Coordinator, to engage in pooling operations in order to expedite the production-boosting program.

In effect, the order means that no aviation gasoline can be made, sold, or shipped except with the Coordinator's approval; and that antitrust laws will not stand in the way of whatever steps the Coordinator finds necessary to make ever-mounting supplies of this essential fuel available in the swiftest possible manner. The action puts the manufacture of aviation gasoline on a wartime basis to insure that all needs for the super fuel can be coordinated and handled quickly and effectively.

Applies to Base Stocks

The provisions apply not only to the finished product itself, but also to the high-octane gasoline base stocks and the blending agents used in its manufacture. In addition to this strict control over future disposal of aviation gasoline, the order calls for reports from all refiners, as to their existing contracts.

Specifically, the order reads, in part: "Within 30 days from the date hereof, there shall be filed in the Office of Petroleum Coordinator for National Defense a full statement of the terms of existing contracts and agreements for the production, storage, use, sale, or other disposition of all grades of aviation gasoline and all grades of aviation gasoline base stocks and blending agents."

It further provides that, except in accordance with plans approved under the expansion program:

"No action shall be taken by any producer or refiner of any grade of aviation gasoline, aviation gasoline base stocks or aviation gasoline blending agents with respect to the production, storage, use, sale, or other disposition thereof without giving antecedent advice thereof to the Petroleum Coordinator for National Defense in order that he may have an opportunity to make specific recommendations with respect thereto."

Pooling Permitted

Pursuant to the direction of the Petroleum Coordinator, the authorization for pooling operations permits companies to combine their production, transportation and refining facilities; and to sell, lend, or exchange among one another their stocks of crude oil, gasoline and blending agents, and their patents and processes "whenever and to whatever extent may be necessary to facilitate the maximum production of all grades of aviation gasoline or to reduce the time required to produce such gasoline."

The Coordinator's Office pledges its assistance in obtaining price adjustments whenever costs of the expansion program shall so warrant.

Priority Ratings

Other developments in the program to boost the production of aviation gasoline as speedily as possible included: (1) The granting of top priority ratings for five more plants which will manufacture 100-octane aviation gasoline or some of its components, and the obtaining of high ratings for materials to be used in the construction of facilities for the manufacture of aviation and other special lubricating oils required under the defense program; (2) a meeting of refiners of 100-octane aviation gasoline and their technical experts from all parts

(See AVIATION GASOLINE, page 15)

New Type Approvals

(Approval numbers and dates of assignment in parenthesis)

Type Certificates

Propellers

McCauley, MAC20a-SS250-10, steel, 7 ft. 2 in. diameter, adjustable pitch, 175 hp., 2,450 r. p. m. (781, 11-24-41.)

New Models Added to Old Type Approvals

(Approval numbers and dates of approval of new models in parenthesis)

Aircraft

Meyers, OTW-145, 2 place open land bi-plane, Engine, Warner Super Scarab Series 50A. (Type Certificate No. 738, 11-19-41.)

Propellers

Hartzell, 889, wood, 7 ft. 9 in. diameter, 4 ft. 6 in. pitch, 145 hp., 2,050 r. p. m. (Approved Type Certificate No. 419, 11-18-41.)

Appliances

Federal, SKT-1 skis, Approved static load per ski 700 lbs. (Type Certificate No. 82, 11-20-41.)

Airplane Production Quadrupled in Year, Says OPM Aide

The United States production of airplanes generally has quadrupled within a year and engine manufacturers are delivering a total of over 4 million horsepower a month, a tremendous advance over last January.

This was the picture of America's defense effort in the aircraft field described by Merrill C. Meigs, chief of the aircraft branch of the Office of Production Management, in a recent radio broadcast.

He said it is generally agreed that the combined American, Canadian, and British production is forging rapidly ahead of the Axis Powers. Mr. Meigs, who recently flew to England and back on an American B-24 bomber, added that British pilots and their commanders are enthusiastic about the performance of American-made planes.

Difference in Time

Asked why the mass production technique of the automobile industry couldn't be applied to airplane manufacture, Mr. Meigs pointed out that "it took 25 years to perfect the technique of automobile assembly, whereas it is only a little over a year since we went into real quantity production of airplanes."

He further explained that there was very little similarity between plane and auto manufacture:

"For one thing, a light bomber weighs up to 20,000 pounds against 2,000 for a light automobile. Then, again, the engines can't be turned out on an automobile assembly line geared for speed. The plane engine is put together with a precision that would make an ordinary assembly line worker feel like a watchmaker."

Plane Assembly Lines

Mr. Meigs stated, however, that "most of what we're doing is based on the experience America gained from building cars—and that's where we get our thousands of highly skilled mechanics. We're using assembly lines in our new airplane factories, too, but they're different from the automobile assembly lines."

Higher speed, greater distance, higher altitude, more fire power are some of the objectives of the constant experimenting to develop new types of aircraft, according to Mr. Meigs.

"Our job of plane production is the biggest job any industry in any country ever tackled," he concluded. "Since the Wright brothers flew that first plane, the United States has produced, all told, 75,000 planes. We are asked to produce within 1 year two-thirds as many planes as this country produced in 37 years. That is like asking the automobile industry to produce 53 million complete, modern cars in 1 year. And we've not only promised to supply our armed forces with that stupendous number of planes, but planes that will be better than any produced anywhere in the world."

CIVIL AERONAUTICS BOARD OFFICIAL ACTIONS

Abstracts of Opinions, Orders, and Regulations

FOR THE PERIOD DECEMBER 1-15, 1941

ORDERS

ORDER No. 1408 December 2, 1941

Granted American Airlines, Inc., permission to intervene in the application of Canadian Colonial Airways, Inc., for a certificate of public convenience and necessity authorizing air transportation between New York, N. Y., and Massena, N. Y.

ORDER No. 1409 December 2, 1941

Granted American Airlines, Inc., permission to intervene in the application of Southwest Feeder Airlines, Inc., for a certificate of public convenience and necessity authorizing the scheduled transportation by air of mail, persons and property, and mail and property by the pick-up method.

ORDER No. 1410 December 2, 1941

Granted Chicago & Southern Air Lines, Inc., permission to intervene in the proceeding outlined in Order, Serial No. 1409.

ORDER No. 1411 December 2, 1941

Granted Braniff Airways, Inc., permission to intervene in the proceeding outlined in Order, Serial No. 1409.

ORDER No. 1412 December 2, 1941

Granted Transcontinental & Western Air, Inc., permission to intervene in the proceeding outlined in Order, Serial No. 1409.

ORDER No. 1413 December 2, 1941

Granted Mid-Continent Airlines, Inc., permission to intervene in the proceeding outlined in Order, Serial No. 1409.

ORDER No. 1414 December 2, 1941

Granted Mercury Development Corp. permission to intervene in the proceeding outlined in Order, Serial No. 1409.

ORDER No. 1415 December 2, 1941

Granted Continental Air Lines, Inc., permission to intervene in the proceeding outlined in Order, Serial No. 1409.

ORDER No. 1416 December 2, 1941

Denied Keith Kahle permission to intervene in the proceeding outlined in Order, Serial No. 1409.

ORDER No. 1417 October 29, 1941

Denied the petition of Caribbean-Atlantic Airlines, Inc., for reconsideration of the order of the Board (Serial No.

1191) consolidating the applications of Caribbean-Atlantic Airlines, Inc., and Aerovias Nacionales de Puerto Rico, Inc., into one proceeding.

ORDER No. 1418 December 5, 1941

Denied approval of the acquisition by American Export Airlines, Inc., of all or substantially all of the issued and outstanding stock of Taca, S. A. (Opinion and order—Docket No. 491.)

ORDER No. 1419 December 5, 1941

Granted United Air Lines Transport Corp. permission to inaugurate non-stop service between Red Bluff and Oakland, Calif., points on Route No. 11, on December 5, 1941.

ORDER No. 1420 December 5, 1941

Revoked student pilot certificate No. S-153093, held by Everett Funnell, Whitehall, Mich., for piloting an aircraft carrying a passenger other than a certificated instructor in violation of the Civil Air Regulations.

ORDER No. 1421 December 5, 1941

Revoked student pilot certificate No. 194438, held by Howard Poberezny, West Allis, Wis., for piloting an aircraft carrying a passenger other than a certificated instructor and other violations of the Civil Air Regulations.

ORDER No. 1422 December 5, 1941

Consolidated for the purpose of hearing the applications of Transcontinental & Western Air, Inc., and American Airlines, Inc., for a certificate of public convenience and necessity and amendment of an existing certificate.

ORDER No. 1423 December 5, 1941

Denied the petition of Chicago & Southern Air Lines, Inc., for consolidation of its application for a certificate of public convenience and necessity with the applications of Transcontinental & Western Air, Inc., and American Airlines, Inc., but granted it permission to intervene in the proceeding.

ORDER No. 1424 December 5, 1941

Granted United Air Lines Transport Corp. permission to intervene in the proceeding outlined in Order, Serial No. 1422.

ORDER No. 1425 December 5, 1941

Approved interlocking relationships contained in the application of Thomas Wolfe and Western Air Lines, Inc.

ORDER No. 1426 December 5, 1941

Consolidated into one proceeding for the purpose of hearing the application of American Export Airlines, Inc., for a temporary certificate of public convenience and necessity authorizing air transportation between New York, N. Y., and Foynes, Irish Free State, and the application of Pan American Airways Co. for temporary amendment of an existing certificate so as to authorize service between Lisbon, Portugal, and Foynes, Irish Free State.

ORDER No. 1427 December 5, 1941

Authorized the transfer to Transcontinental & Western Air, Inc., of the certificate of public convenience and necessity authorizing air transportation between St. Louis, Mo., and Detroit, Mich., formerly issued to Marquette Airlines, Inc.

ORDER No. 1428 December 9, 1941

Denied the petition of Transcontinental & Western Air, Inc., for reconsideration of the order of the Board (Serial No. 1352) in which TWA's application to serve Atlantic City, N. J., was denied.

ORDER No. 1429 December 9, 1941

Amended Order Serial No. 1381, temporarily exempting Pan American Airways Co. from section 401 (a) of the Civil Aeronautics Act so as to temporarily authorize air transportation between Lisbon, Portugal, and New York, N. Y., via certain intermediate points, to prohibit carrying of passengers, property or mail between New York and Port of Spain, Trinidad; between New York and Belem, Brazil; or between New York and Natal, Brazil, except by special permission.

ORDER No. 1430 December 9, 1941

Revoked aircraft mechanic certificate No. 17610, held by Raymond V. Korty, Lafayette, Ind., for inspecting and certifying aircraft as airworthy when in fact such aircraft were not airworthy in violation of the Civil Air Regulations. (Opinion and order.)

ORDER No. 1431 December 5, 1941

Suspended for 180 days student pilot certificate No. S-166445, held by Arthur W. Geiser, for piloting an aircraft in the vicinity of Van Nuys, Calif., carrying a passenger other than a certificated

instructor, in violation of the Civil Air Regulations. (Opinion and order.)

ORDER No. 1432 December 9, 1941

Granted John H. Nance, Jr., permission to apply for the special issuance of a commercial pilot certificate on or after December 15, 1941, pursuant to section 20.35 of the Civil Air Regulations. (Opinion and order.)

ORDER No. 1433 December 9, 1941

Approved interlocking relationships contained in the application of John J. Bergen and Canadian Colonial Airways, Inc.

ORDER No. 1434 December 11, 1941

Granted Pan American Airways Co. temporary exemption from the Civil Aeronautics Act so as to permit it to engage in air transportation to and from Camaguey, Cuba, as an intermediate point on its routes between Miami, Fla., and San Juan, P. R., and Miami, Fla., and Cristobal, C. Z.

ORDER No. 1435 December 12, 1941

Granted Eastern Air Lines, Inc., permission to inaugurate non-stop service between Baltimore, Md., and Charleston, S. C., on Route No. 6, on December 15, 1941.

ORDER No. 1436 December 12, 1941

Amends previous order (Serial No. 934) so as to permit Joe Adamson, Okmulgee, Okla., to apply for a new student pilot certificate on or after December 15, 1941.

REGULATIONS

REGULATION No. 197 Dec. 5, 1941

Effective Dec. 5, 1941:
"Notwithstanding the effective date of amendments Nos. 60-25 to 60-43, inclusive, to the Civil Air Regulations, the Administrator, in the interest of safety and after finding it necessary for the proper control of air traffic, may designate new or additional, or amend or repeal any existing designation of, control zones of intersection, radio fixes, airway traffic control areas, or control airports."

AMENDMENT 20-23 Dec. 10, 1941

Effective Dec. 10, 1941:
"20.617 *Permission to use aircraft.* The owner of an aircraft shall not permit any person to operate such aircraft unless he has ascertained that such person is the holder of an appropriate currently effective pilot certificate by actual examination of the certificate and by requiring such person to identify himself as the person referred to in the certificate. If any pilot is found to have piloted an aircraft after December 10, 1941, without possessing an appropriate currently effective pilot certificate, the owner of the aircraft will be presumed to have permitted such piloting in violation of this section."

CAB OPINIONS

Six more of the individually printed opinions of the Civil Aeronautics Board in economic cases are available. Copies of these "advance sheets" may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 5 cents per copy. The opinions include:

No. 40—Docket No. 162 *Et Al.*, ADDITIONAL SERVICE TO ATLANTA AND BIRMINGHAM.

No. 41—Docket No. 566, EASTERN AIR LINES, INC.—BIRMINGHAM-NEW ORLEANS NON-STOP SERVICE.

No. 42—Docket No. 438, INLAND AIR LINES, INC.—CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY (*Alliance, Nebr. Operation*).

No. 43—Docket No. 397, AMERICAN AIRLINES, INC.—CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY (*Windson and Niagara Falls Operation*).

No. 57—Docket No. 614, BRITISH OVERSEAS AIRWAYS CORPORATION.—PERMIT TO FOREIGN AIR CARRIER (*Trans-Atlantic and Bermuda Operations*).

No. 59—Docket No. 579, WESTERN AIR LINES, INC.—CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY.

AMENDMENT 60-47 Dec. 2, 1941

Effective Dec. 15, 1941:
"60.471 *Contact flight above 3,500 feet on civil airway.* In addition to all contact flight rules, aircraft flying under contact conditions at an altitude of more than 3,500 feet above the ground or water and within the limits of a civil airway shall conform to the rules prescribed for flight under instrument conditions in the following respects:

(1) Compliance with § 60.53, *Flight plan*, when flights touch airways traffic control areas;

(2) Maintenance of flight altitude (§ 60.58); and

(3) Maintenance of communication contacts (§ 60.571).

(4) No change in an approved flight plan shall be made without the prior approval of the airway traffic control center concerned unless an emergency situation arises which requires immediate decision and action or unless weather conditions make it necessary for the pilot to effect such change in order to continue flight in accordance with contact flight rules; in either case the proper airway traffic control center shall be notified as soon as possible."

AMENDMENT 60-48 Dec. 10, 1941

Effective Dec. 10, 1941:
"60.322 *Pilot identification card.* No pilot shall pilot civil aircraft (except scheduled air carrier aircraft) in flight after January 8, 1942, unless he has in his possession, in addition to a currently effective pilot certificate, an identification card, satisfactory to the Administrator, containing his fingerprints, his picture, and his signature."

AMENDMENT 60-49 Dec. 10, 1941

Effective Dec. 10, 1941:
"60.3305 *Pilot clearance.* No pilot of a civil aircraft, except scheduled air carrier aircraft, shall take off from any landing area unless, immediately prior to take-off, he shall have (1) received clearance from a police officer or other public representative designated at such landing area for that purpose and present at such landing area at the time clearance is granted, and (2) filed with such police officer or other public representative a written statement showing the type, color, and identification mark of the aircraft, the estimated time of departure, the point of next intended landing, the route to be followed, and the estimated time of arrival, *Provided*, that if a pilot contemplates a series of take-offs and landings for instruction, practice, or flight-testing, one clearance only need be secured for such series and, in lieu of the statement described in (2) above, he may file a statement including the type, color, and identification mark of the aircraft and setting forth his intention to engage in landing and take-off instruction or practice or flight-testing and the approximate duration of such operation. A clearance shall be granted to any person who demonstrates to the satisfaction of the police officer or other public representative to whom application is made that he is the holder of a currently effective pilot certificate and, after January 8, 1942, presents the identification card required by section 60.332. No clearance issued under this section shall be deemed to authorize a violation of any regulation."

AMENDMENT 60-50 Dec. 10, 1941

Effective Dec. 10, 1941:
"60.349 *Passenger baggage restrictions.* A pilot shall not pilot any aircraft (except scheduled air carrier aircraft) in flight carrying passenger's baggage or cargo unless every item of such baggage or cargo has been thoroughly searched by the pilot, or a person designated by him, immediately prior to taking off for the flight and placed in the aircraft by the pilot or a person designated by him (with no possession by any other person intervening between such search and the placing of the baggage or cargo in the aircraft). If such baggage or cargo includes a camera, such camera shall be placed in a closed compartment or space in the aircraft completely inaccessible to all passengers during the flight. Any pilot shall permit the search of his aircraft upon demand by any representative of the Army, Navy, Civil Aeronautics Administration, Civil Aeronautics Board, or by civil police."

Accident Record

A record of 1,000,000 man-hours without a lost-time accident has been reported by an aircraft manufacturer. This is said to be the first time in the history of the aircraft industry in which a plant achieved this accident-free record.

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Winter Flights

(Continued from page 5)

difference between an accident and a safe continuation of the flight or successful forced landing. Some advantages of warmth may be lost if it is obtained by the use of bulky and awkward clothing. Clothing which may affect the freedom of motion of a pilot should be avoided.

There are two types of cabin heaters in use today. The first, a hot-air exhaust preheater type, and the second a steam heating unit. The latter is restricted almost exclusively to larger aircraft. The former, which is the type prevalent in smaller aircraft, may introduce a serious hazard unless it is properly serviced and maintained. Great care should be taken to see that the heater is functioning properly and is not introducing exhaust gases into the cabin.

Carbon monoxide gas has no odor and cannot be detected before it starts taking effect on the human system. Its symptoms are a headache, weakness, dizziness, or nausea, and if one is exposed to the condition for any length of time a complete collapse will occur. If any of the symptoms are noted or suspected during flight, make certain that the heater is immediately turned off and the windows opened. The flight should be terminated at the nearest emergency field or airport.

Water in Gasoline

It is good practice to fill the fuel tank to capacity before storing an aircraft. However, make certain that sufficient room is allowed for expansion to prevent a possible overflow of the gasoline if the ship is moved into a warm hangar. Water accumulates in the gas tank because of condensation of the water vapors in the air when there is a decrease in temperature. The condensation can be markedly reduced if the actual volume of air in the tank is kept at a minimum during storage periods.

Water can also be introduced into the fuel system if the source of fuel is poorly maintained or is not equipped with water separators. The source should be checked and if water is suspected it is advisable to strain the fuel through a chamois strainer when filling the tank.

During extremely cold weather, condensate in the tank or lines will freeze; and if the ice is free, the lumps of ice will clog the fuel line. The strainers, sediment bowls, and tanks should be inspected frequently and drained of any water accumulation.

Windshields

Windshields should be inspected and replaced if aged or cracked. Old pylon windshields are more subject to embrittlement due to low temperature than new ones. A broken windshield in flight may seriously affect the aerodynamic characteristics of the aircraft and may result in an accident. Windshield defrosters should be inspected and checked for

satisfactory operating conditions. It is wise to carry a putty knife or scraper so that ice formation on the windshield can be removed manually in emergency conditions.

— Keep 'Em Flying —

Aviation Gasoline

(Continued from page 12)

of the United States at the Office of Petroleum Coordinator to discuss means of increasing production. At this session technical reports were made by S. D. Heron, vice chairman, and D. P. Barnard, member, of the subcommittee on fuels and lubricants of the National Advisory Committee for Aeronautics.

Additional Plants

A list of the additional plants of all types for which priorities have been obtained follows:

Cities Service Co., East Chicago, Ind., 100-octane; Warren Petroleum Co., Tulsa, Okla., isobutane; Panhandle Power & Light Co. (To supply power to new 100-octane plant). Borger, Tex., boiler plant; Standard Oil of Louisiana, New Orleans, La., catalytic cracking plant; Shell Oil Co., Houston, Tex., pilot plant; Gulf Oil Corp., Port Arthur, Tex., 100-octane; Sinclair Refining Co., Houston, Tex., 100-octane; Sinclair Refining Co., Houston, Tex., aviation lubes; Sun Oil Co., Marcus Hook, Pa., aviation and special lubes; Standard Oil of California, Richmond, Calif., aviation and special lubes.

Induction System

(Continued from page 7)

scoop and carburetor. It should be wise for all the operators to prohibit the use of rags as protective coverings or as a means of temporarily plugging the intake passage or any other part of the engine when work is being done on it. Carburetors, scoops, and manifolds should be sealed or covered only with metal or wooden plates. Mechanics should be cautioned against using the cowl as a temporary shelf for tools, waste, parts, etc. Other openings such as fuel lines, drains, etc., should be stopped with wooden or rubber plugs and not with rags or paper wadding.

Discarded Paper

Foreign materials such as napkins and paper cups have been drawn into the induction system during taxiing or warming up of the engine. In one case it was noted that the pilot discarded a sanitary microphone cover by throwing it out of the cockpit window and the paper cover was carried in through the scoop to the carburetor, resulting in the malfunctioning of the engine. This possible source of foreign materials was eliminated by providing receptacles in the pilots' cockpit for the disposition of these covers, napkins, etc., and forbidding the disposal of any materials through the cockpit window.

A careful inspection and cleaning of the loading ramps and field in general to keep them free from paper and other

light materials would avoid the causes of some of the other interruptions.

Screens Recommended

The use of a screen at the carburetor flange before the venturi is strongly recommended providing, of course, that the aircraft is equipped with adequate means of preventing the formation of impact ice and snow on the screen. Adherence to the regulations as set forth in Certificate and Inspection Release No. 21 should adequately take care of the dangers of screen icing.

The use of a screen will not eliminate the hazards of blanketing the air intake by rags, paper, leaves, etc., if they are introduced in large quantities, but it will remove the dangers of damaged or broken impellers due to the introduction of nuts, cotter pins, bolts, etc. The former hazard can be eliminated only by careful education of personnel; by the establishment of definite company rules with respect to the use of rags; and by careful maintenance of the airport grounds.

— Keep 'Em Flying —

Accidents

(Continued from page 9)

ior Pilot John Van Brussel, and the radio operator, Orville B. Bivens. All were properly certificated and appropriately rated. The aircraft, a Model S-43 Sikorsky, owned by Pan American Grace Airways, Inc., was demolished.

The aircraft was taking off about 2:15 p. m. for a local practice flight which was to include instrument approaches, let-downs, and landings. Captain Garrison was making the final let-down with Captain Anderson as first officer, when at an altitude of approximately 200 feet, light rain was encountered. Visibility, however, was 2 miles or more. He held the aircraft at an air speed of about 80 knots with an indicated rate of descent of about 100 feet per minute. There was no wind and the water was glassy with medium swells. The aircraft contacted the water in a nose down attitude and, as the bow wave built up, the nose became more depressed. The aircraft continued in this manner for a short time and then turned over on its back and sank.

The evidence indicates that there was no malfunctioning of the engines or failure of the control system or structure. The aircraft was properly loaded within the approved limits. The evidence indicates that the pilot erroneously estimated his altitude above the glassy surface of the harbor.

Probable Cause.—Pilot's error in judging altitude during a landing.

Contributing Factor.—Glassy surface of the water.

Light Planes for Army

The War Department has announced placing of a new order for light planes to be used on such military tasks as maintaining liaison with ground forces, spotting artillery fire, and doing courier work.

Status of Parts of the Civil Air Regulations and Regulations of the Administrator of Civil Aeronautics

As of Dec. 15, 1941

All persons affected by these Regulations, including those preparing for examinations for certificates may obtain required Parts of the Regulations from the Publications and Statistics Division, Civil Aeronautics Administration, Washington, D. C., without charge.

ONLY PARTS NEEDED SUPPLIED FREE

For example, pilots are governed in general by Parts 01., 20., 60., and 98.; aircraft mechanics by Parts 01., 04., 15., 18., 24., 98., and Section 60.32; and aircraft engine mechanics by Parts 01., 04., 13., 14., 18., 24., and 98. It should be remembered that individuals are entitled to receive free of charge only those portions of the Regulations which directly govern the activity in which they are engaged and this activity must be definitely stated when request is made.

HOW TO OBTAIN PARTS, AMENDMENTS, AND MANUALS

Those persons not affected by the Regulations, but desiring all or any part of the

Regulations for other purposes, may obtain them as follows: Those Parts on which a price is listed in the tabulation below are on sale by the Superintendent of Documents, U. S. Government Printing Office (shown as G. P. O. in table), Washington, D. C., and are not available for free distribution except as stated in the first paragraph.

Eventually, all Parts will be placed on sale; meanwhile, Parts not yet on sale (carrying remark in tabulation below "order from C. A. A. only") may be obtained without charge from the C. A. A. upon demonstration of valid interest on the applicant's part.

ALL AMENDMENTS TO THE REGULATIONS, AND NOTICE OF NEW PARTS, ARE PRINTED IN THE CIVIL AERONAUTICS JOURNAL, AS RELEASED.

The tabulation below carries in the right-hand column the numbers of all effective amendments to each Part issued subsequent to its publication. Parts ordered from C. A. A. include all effective amendments,

but when Parts are purchased from G. P. O. amendments must be requested separately from C. A. A.

Civil Aeronautics Manuals supplementing certain Parts with detailed interpretations of their respective provisions are issued. They are numbered the same as the Parts they supplement, and those Parts accompanied by Manuals carry appropriate notations. All Manuals are obtained from C. A. A. only, without charge.

PARTS CANCELLED AND UNASSIGNED

Cancelled Parts 00. and 03. now incorporated in Part 01.; cancelled Part 23. now incorporated in Part 51.; and cancelled Part 25. now incorporated in Part 24. Parts 90.-96., inclusive, cancelled. All other Part numbers not shown are unassigned.

Bound volumes of the complete Civil Air Regulations are no longer available. Parts and amendments are punched for filing in loose-leaf binders.

Civil Air Regulations

PART NO.	TITLE	DATE	REMARKS	PRICE	EFFECTIVE AMENDMENTS
AIRCRAFT					
01	AIRWORTHINESS CERTIFICATES.....	11-1-41	Out of stock; to be available soon at C. A. A. and on sale at G. P. O.	\$0.05	
02	TYPE AND PRODUCTION CERTIFICATES.....	3-1-41	In stock at C. A. A. and on sale at G. P. O.	.05	116 129.
04	AIRPLANE AIRWORTHINESS (MANUAL 04, 2-1-41) ¹ ..	4-1-41	In stock at C. A. A. and on sale at G. P. O.	.15	
13	AIRCRAFT ENGINE AIRWORTHINESS (MANUAL NOT ISSUED).	8-1-41	In stock at C. A. A. and on sale at G. P. O.	.05	
14	AIRCRAFT PROPELLER AIRWORTHINESS (MANUAL 12-1-38).	11-15-40	In stock; order from C. A. A. only		
15	AIRCRAFT EQUIPMENT AIRWORTHINESS (MANUAL 15, OUT OF STOCK).	11-15-40	In stock; order from C. A. A. only		
16	AIRCRAFT RADIO EQUIPMENT AIRWORTHINESS (MANUAL, 2-13-41) ¹ .	2-13-41	In stock at C. A. A. and on sale at G. P. O.	.05	
18	MAINTENANCE, REPAIR, AND ALTERATION OF CERTIFICATED AIRCRAFT AND OF AIRCRAFT ENGINES, PROPELLERS, AND INSTRUMENTS. (MANUAL 18, 6-1-41).	6-1-41	In stock; order from C. A. A. only		
AIRMEN					
20	PILOT CERTIFICATES.....	5-1-40	In stock at C. A. A. and on sale at G. P. O.	.05	63, 65, 67, 75, 82, 83, 87, 88, 99, 101, 107, 110, 111, 112, 115, 117, 118, 125, 126, 127, 20-22, 20-23, 87, 101, 115.
21	AIRLINE TRANSPORT PILOT RATING.....	11-15-40	In stock; order from C. A. A. only		
22	LICHTER-THAN-AIR PILOT CERTIFICATES.....	9-15-41	In stock at C. A. A. and on sale at G. P. O.	.10	
24	MECHANIC CERTIFICATES.....	5-1-40	In stock at C. A. A. and on sale at G. P. O.	.05	44, 61, 73, 75, 87, 109.
26	AIR-TRAFFIC CONTROL TOWER OPERATOR CERTIFICATES.	10-4-40	Out of stock; to be available soon at C. A. A. and on sale at G. P. O.	.05	87.
27	AIRCRAFT DISPATCHER CERTIFICATES.....	7-15-40	In stock at C. A. A. and on sale at G. P. O.	.05	74, 75, 87.
AIR CARRIERS					
40	AIR CARRIER OPERATING CERTIFICATION.....	11-1-40	In stock at C. A. A. and on sale at G. P. O.	.05	85, 89, 102, 129, 133.
AIR AGENCIES					
50	FLYING SCHOOL RATING (MANUAL 50, 12-40) ²	11-1-40	In stock at C. A. A. and on sale at G. P. O.	.05	87, 113.
51	GROUND INSTRUCTOR RATING.....	5-1-40	In stock at C. A. A. and on sale at G. P. O.	.05	75, 87, 128.
52	REPAIR STATION RATING (MANUAL 52, 2-41)	5-1-40	In stock at C. A. A. and on sale at G. P. O.	.05	75, 84, 87.
53	MECHANIC SCHOOL RATING (MANUAL 53, 5-40).....	9-15-40	In stock at C. A. A. and on sale at G. P. O.	.05	75, 87.
AIR NAVIGATION					
60	AIR TRAFFIC RULES (MANUAL 60; PART 1, 12-1-40; PART 2, 8-1-40; PART 3, 12-1-40).	10-4-40	In stock at C. A. A. and on sale at G. P. O.	.10	80, 90, 93, 102, 104, 108, 114, 119, 120, 121, 123, 124, 127, 135, 60-21, 60-22, 60-23, 60-24, 60-25 thru 60-43, ⁴ 60-44 thru 60-50, Spec. Reg. Ser. 177.
61	SCHEDULED AIR CARRIER RULES.....	1-1-41	In stock at C. A. A. and on sale at G. P. O.	.05	91, 94, 97, 102, 115, 120, 122, 129, 130, 132, 134 61-17, 61-18, 61-19, Spec. Reg. Ser. 182, 188, 192.
MISCELLANEOUS					
98	DEFINITIONS.....	11-15-40	Out of stock; to be available soon at C. A. A.		
99	MODE OF CITATION OF REGULATIONS.....	11-15-40	In stock; order from C. A. A. only		

Regulations of the Administrator

501	AIRCRAFT REGISTRATION CERTIFICATES.....	11-1-41	In stock; order from C. A. A. only	
510	GENERAL REGULATIONS, WASHINGTON NATIONAL AIRPORT.	9-26-41	In stock; order from C. A. A. only	
511	GENERAL AERONAUTICAL RULES FOR THE WASHINGTON NATIONAL AIRPORT.	9-26-41	In stock; order from C. A. A. only	
525	NOTICE OF CONSTRUCTION OR ALTERATION OF STRUCTURES ON OR NEAR CIVIL AIRWAYS.	11-1-41	In stock; order from C. A. A. only	

¹ Amendment as issued by C. & I. Div. Release 50, 6-3-41.
² Amendment No. 1 issued as S. R. Release No. 62, 8-12-41.

³ Amendment 4-14-41 issued as S. R. Release No 77, 11-13-41.
⁴ Effective 1-20-42.

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